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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,404

09/19/2006

Elias Bitar

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EXAMINER

OLSEN, LIN B

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/593,404	<b>Applicant(s)</b> BITAR ET AL.	
	<b>Examiner</b> LIN B. OLSEN	<b>Art Unit</b> 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/19/2006, 4/13/2007</u> .                                    | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

The information disclosure statement filed 19 September 2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. A translation of French patent No. 0211320 was not supplied, only the odd pages of the article by Horng were supplied and the article by Gunilla Borgefors was not supplied. These items have been lined out of the IDS and will not be considered. The information disclosure statement filed 13 April 2007 is duplicative of the IDS filed 19 September 2006. It has been placed in the application file, but the information referred to therein has not been considered as to the merits.

### ***Specification***

The abstract of the disclosure is objected to because the expression "1DT(V)-DT(0)1" is used with no support in the specification. The Examiner considers that this expression is meant to be [DT(V)-DT(0)] and will examine the claims in that way. Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informalities: The amendments to the specification were not entered, therefore the headings for the Background of the Invention, Field of the Invention, Description of the Prior Art, Summary of the Invention, Brief Description of the Drawings and Detailed Description of the Embodiments are omitted. Appropriate correction is required.

### ***Drawings***

Figures 2 and 3a and 3b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claim 1 is objected to because of the following informalities:

The first step of the method is missing a verb. Examiner presumes this is an editing error and will examine the claim as if the verb "analyzing" were present.

Further, in the third line of the claim, an extra "is" remains from the entry of amendments.

Still further the expression "1DT(V)-DT(0)1" is used with no support in the specification. The Examiner considers that this expression is meant to be [DT(V)-DT(0)] and will examine the claims in that way. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,504,686 (Lippitt). Lippitt is concerned with mission planning using digital terrain elevation data.

Regarding independent claim 1, A method of locating difficult access points on a topological map established on the basis of a map of curvilinear distances, comprising the steps of: - The examiner takes Official Notice that “difficult of access” points have been defined as those which exhibit a marked rise in the land versus neighbor points. This condition has no common descriptive designation could also be termed “slopesness”. It would have been obvious to one of ordinary skill in the art at the time of the invention to use “difficult of access” and “slopesness” interchangeably for this concept.

- [analyzing] the map of curvilinear distances [is] by means of a chamfer mask cataloging the approximate values  $C(V)$  of the Euclidean distances by separating a point  $C_{00}$  of the map from its nearest neighbors  $V$ , so as to extract therefrom, at each point  $C_{00}$  of the map of curvilinear distances, the discrepancies  $[DT(V)-DT(0)]$  of curvilinear distances separating the point considered  $C_{00}$  from its nearest neighbors  $V$ , and - Lippitt (col. 4, lines 12-32) analyzes the a data on digital terrain elevation map to determine “flyability,” where flyability is indicative of the roughness of the terrain. Lippitt applies a

- transform to the data to obtain a slopeness value that is calculated based on each point measured relative to each of its 8 nearest neighbors. While Lippitt does not use the term “chamfer mask” to describe the transform, Lippitt’s transform yielded the same result and is not explicitly stated that a chamfer mask was not used. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the simple substitution of Lippitt’s method for the chamfer mask to yield a measure of steepness of terrain.
- comparing these discrepancies  $[DT(V)-DT(0)]$  with the approximate values  $C(V)$  of the Euclidean distances of the chamfer mask and describe the point considered as difficult of access when a difference appears. – As Lippitt states, (col. 4, 24-26) a high slopeness is indicative of rough terrain while a low slopeness value indicates the terrain is relatively flat. It would have been obvious to one of ordinary skill in the art at the time of the invention to equate Lippitt’s high slopeness with applicant’s point of difficult of access as they are simple substitutions of adjectives.

Regarding claim 2, which is dependent on claim 1, wherein: several thresholds are used during the comparison of the discrepancies of curvilinear distances and Euclidean distances, so as to devise degrees in the importance of the detour required to reach a difficult access point. – Lippitt illustrates quantization of the flyability index into 16 levels at col. 4 lines 36-52.

Regarding claim 3, which is dependent on claim 1, wherein: the points of the map of curvilinear distances that are regarded as difficult of access are located on the topological map established on the basis of the map of curvilinear distances by a pattern and/or a particular texture. – Fig. 8 illustrates a flyability map where areas having different flyability ratings are noted by varying degrees of grey. The examiner notes that grays can be produced by various patterns and it would have been obvious to one of ordinary skill in the art at the time of the invention use the known method of creating shades of grey with various patterns in creating the topological maps.

Regarding claim 4, which is dependent on claim 2, wherein the degrees in the importance of the detour required of a difficult access point are evidenced on the topological map by different patterns and/or textures. – Fig. 8 uses the quantizations of col. 4 to vary the grays indicating degrees of slopiness; therefore areas with no flyability (very important that a pilot detour) are highlighted as white.

Regarding claim 5, which is dependent on claim 1, wherein the chamfer mask used for the locating of the difficult access points is of dimension 3 x 3. – Lippitt uses the eight positions around each point for his transform (Fig. 3 and col. 4 lines 16-20) and a 3 x 3 mask considers the same points. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the known chamfer mask when computing the 8 point transform of Lippitt to determine flyability.



Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lippitt as applied to claims 1-4 above, and further in view of "Distance Transformations in Digital Images", Gunilla Borgefors, Computer Vision, Graphics and Image Processing, pgs 344-371 (1986). Borgefors details the mechanics of Digital Transformations, in particular the use of chamfer masks.

Regarding claim 6, which is dependent on claim 1, wherein the chamfer mask used for the locating of the difficult access points is of dimension 5 x 5. – while Lippitt uses a 3 x 3 mask not a 5 x 5, Borgefors teaches at the second paragraph of page 348 that better approximations to the EDT are realized using larger sized neighborhoods such as 5 x 5 or 7 x 7 neighborhoods. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Borgfors' technique to obtain a better approximation to Lippitt's algorithm for computing slopiness to achieve the predictable result of greater accuracy.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

"Optimum Design of Chamfer Distance Transforms" Butt, Muhammad Akmal and Maragos, Pertos, IEEE Transactions on Image Processing, Vol. 7, No 10, Oct 1998 Pgs 1477-1484;

U.S. Patent No. 5,086,396 to Waruszewski et al. for analysis of digitized terrain maps in aviation;

U.S. Patent No. 5,173,946 to Rao for an image matching method using 3 x 3 chamfer mask;

U.S. Patent No. 5,444,918 to Seki et al for analyzing map data to yield "other" data;

U.S. Patent No. 5,839,090 to Zoraster for incorporating high quality geological interpretations in to computer generated contours;

U.S. Patent No. 7,120,540 to Meunier for use of colored and/or textured maps in anti collision displays;

U.S. Patent No. 7,233,859 to Lundberg for using a 5 x 5 matrix in planning a trajectory with minimum threat exposure;

U.S. Patent Pub. No. 2006/0077092 to Gilliland for letting pilot see representation of roughness;

U.S. Patent Pub. No. 2007/0027588 to Astruc et al. for aircraft flight safety device and

U.S. Patent Pub. No. 2—7/0053609 to Bitar for methods of determining optimal chamfer masks coefficients or a distance transform.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIN B. OLSEN whose telephone number is (571)272-9754. The examiner can normally be reached on Mon - Fri, 8:30 -5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3661

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LO

/Thomas G. Black/

Supervisory Patent Examiner, Art Unit 3661